

## Rotational speed transmitter RM2R with reverse rotation signaling

- 2 inputs in form of pulse train of TTL standard
- 2 separated analog outputs: 4-20mA or 0-10V
- separated interface RS-485 Modbus RTU
- 4 relay outputs

### Application

The RM2R transmitter in its primary operating mode is intended for the measurement of rotational speed and reverse rotation signaling of the rotating machinery i.e. compressors, fans, pumps, electric motors and others. Additionally it can signal the shaft stop and the exceeding of the set threshold values of rotational speed (2 thresholds).

In the optional mode (mode can be changed through the setup program) the transmitter changes into 2-channel device for measuring two different rotational speeds with the possibility of signaling two thresholds of rotational speed for each channel.

### Description

It is designed to work with two RPM detection systems: MDS10 proximity sensor and RT02 transducer. Two sets of MDS10/RT02 system provide two signals from one marker (groove) on the shaft in the form of voltage pulses, which are then transmitted by signal cable to the RM2R transmitter. The value of rotational speed is available in digital form (RS485 ModbusRTU protocol) and in the form of standard analog outputs 4-20mA or 0-10V.

The transmitter has four relays outputs: two of set threshold values, one of reverse rotation and one of shaft stop.

The device configuration is carried out via a miniature connector on the front side. Options in the configuration are:

- choice of analog output
- measuring range of rotational speed
- thresholds values of rotational speed
- time delay of relays activation
- relays energizing (normally energized or de-energized)

On the front side the RM2R has two 3-color LEDs for the information of proper operation and exceeding both thresholds values.

The RM2R has the advantage of having galvanic separation between transmitter power supply circuit and input/output circuits as well as between all inputs and outputs. The separation enables application of the transmitter in noisy industrial environments or distributed systems, where the distance between elements of the system is considerable (up to 300m between RT02 rotation detector and RM2R transmitter).



### Performances

#### METROLOGICAL

##### Inputs:

- two pulse trains in the range: 0-5V to 0-15V
- frequency of pulse: maximum 30kHz
- input impedance: 10kΩ

##### Outputs:

- two separated analog: 4...20mA,  $R_{load} < 500\Omega$  or 0-10V,  $R_{load} \geq 50k\Omega$
- 4 relays, relays contacts 2A/250V AC, 2A/24V DC,
- separated interface RS485 with Modbus RTU

**Measuring range: 0 to 65 000 rpm**

**Accuracy:  $\pm 1$ rpm**

**Time delay of relays activation: 0-60s**

**Relays energizing:** normally energized or de-energized

#### ELECTRICAL

**Power supply:** 24VDC (21,6 to 26,4)

**Power consumption:** <100mA

#### Galvanic separation

power supply/input, output  
input/output

#### ENVIRONMENTAL

**Ambient temperature:** -25°C to +70°C

**Relative humidity:** 90% non-condensing

**CE requirements:** Directive 2014/30/EC –  
Electromagnetic compatibility

#### MECHANICAL

**Weight:** 150g

**Enclosure material:** ABS, mounted on TS35 rail

**Dimensions:** 22,5x99x114mm

**Protection rating:** IP20



**Ordering Information**
**Option 1**

The device operates as rotational speed transmitter with reverse rotation signaling (primary operating mode)

**A B C D E**  
**RM2R1** - ☐ - ☐ - ☐ - ☐ - ☐

- A** ☐ pulse number for 1 shaft revolution (number of grooves or holes on the shaft/shaft disc)  
 In case the number of grooves is greater than 1 must be fulfilled the condition:  
 $\beta > \alpha$ , where:  
 $\alpha$  – the angle between sensors (in the case of MDS10 his minimum size corresponds to the minimum distance between the measuring tips, which is 50 mm)  
 $\beta$  – the angle between two adjacent grooves/holes
- B** ☐ type of analog output for the rotational speed  
 1 output 4 – 20 mA  
 2 output 0 – 10V
- C** ☐ measuring range of rotational speed for analog output. Please specify in rpm e.g. 3500 for the range 0 – 3500 rpm
- D** ☐ threshold value of rotational speed for Alert relay activation from the scope 0-100% of the measuring range  
 Please specify in rpm e.g. 2500.
- E** ☐ threshold value of rotational speed for Alarm relay activation from the scope 0-100% of the measuring range  
 Please specify in rpm e.g. 3300.

All four relays of the transmitter (Alert, Alarm, Reverse Rotation, Shaft stop) are by default normally de-energized and in this state relay contacts which are derived on output terminals of the enclosure are NO (normally open). In the configuration program the power supply of each of these relays can be individually changed into state normally energized which will cause the relay contacts to be "NC" (normally closed).

**Common to both options**

Time delay of actuation relays for Alert and Alarm is set on „0”sek(immediately). In configuration program time delay can be set in the range 0-60s with step 1s.

**Option 2**

The device operates as 2-channel rotational speed transmitter without reverse rotation signaling (optional operating mode)

**A1 A2 B1 B2 C1 C2 D1 D2 E1 E2**  
**RM2R2** - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐

- A1** ☐ pulse number for 1 shaft rotation for channel 1, the choice in the range 1 to 60
- A2** ☐ pulse number for 1 shaft rotation for channel 2, the choice in the range 1 to 60
- B1** ☐ type of analog output for the rotational speed for channel 1  
 1 output 4 – 20 mA  
 2 output 0 – 10V
- B2** ☐ type of analog output for the rotational speed for channel 2  
 1 output 4 – 20 mA  
 2 output 0 – 10V
- C1** ☐ measuring range of rotational speed for analog output for channel 1. Please specify in rpm e.g. 3500 for the range 0 – 3500 rpm
- C2** ☐ measuring range of rotational speed for analog output for channel 2. Please specify in rpm e.g. 3500 for the range 0 – 3500 rpm
- D1** ☐ threshold value of rotational speed for Alert relay actuation for channel 1 from the scope 0-100% measuring range  
 Please specify in rpm e.g. 2500.
- D2** ☐ threshold value of rotational speed for Alert relay actuation for channel 2 from the scope 0-100% measuring range  
 Please specify in rpm e.g. 2500.
- E1** ☐ threshold value of rotational speed for Alarm relay actuation for channel 1 from the scope 0-100% measuring range  
 Please specify in rpm e.g. 3200.
- E2** ☐ threshold value of rotational speed for Alarm relay actuation for channel 2 from the scope 0-100% measuring range  
 Please specify in rpm e.g. 3200.

All four relays of the transmitter (Alert- channel 1, Alarm-channel 1, Alert-channel 2, Alarm-channel 2) are by default normally de-energized and in this state relay contacts which are derived on output terminals of the enclosure are NO (normally open). In the configuration program the power supply of each of these relays can be individually changed into state normally energized which will cause the relay contacts to be "NC" (normally closed).

